

Harvest of the Month



Network for a Healthy California



Nutrition Facts

Serving Size: 1 cup, raw leaves (30g)*

Calories 7

Calories from Fat 1

	% Daily Value
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 24mg	1%
Total Carbohydrate 1g	0%
Dietary Fiber 1g	3%
Sugars 0g	
Protein 1g	
Vitamin A 56%	Vitamin C 14%
Calcium 3%	Iron 5%

Source: www.nutritiondata.com

*See Reasons to Eat Spinach on page 2 for details on serving sizes.

SPINACH
March

Health and Learning Success Go Hand-in-Hand

March celebrates National Nutrition Month and National School Breakfast Week. With state testing just around the corner, it makes for an ideal time to reinforce the importance of nutrition and physical activity and how they can impact a student's academic performance. **Harvest of the Month** connects with core curricula to give students the chance to explore, taste and learn about the importance of eating fruits and vegetables. It links the classroom, cafeteria, home and community to motivate and support students to make healthy food choices and be physically active every day.



Taste Testing with California Spinach

Taste testing activities allow students to experience the featured produce with their senses, engaging them in the learning process and creating increased interest, awareness and support for increasing consumption of fruits and vegetables.

Tools:

- California grown spinach, raw and steamed*
- Enough spinach for each student to sample both
- Paper and pencils

*Spinach may also be microwaved, blanched or sautéed

Activity:

- Taste the raw spinach and note the color, texture, smell, sound and flavor
- Repeat with the steamed spinach
- Look up the nutrition information for raw spinach; then repeat with steamed spinach
- Compare and contrast the nutritional values, as well as serving size equivalents (i.e., 1 cup raw = _____ cup steamed)

For more ideas, reference:

School Foodservice Guide – Successful Implementation Models for Increased Fruit and Vegetable Consumption, Produce for Better Health Foundation, 2005, pp. 39-42.

Cooking in Class: Veggie Tortilla Roll Ups

Ingredients:

Makes 32 tastes at ¼ piece of roll

- 8 whole wheat tortillas
- 12 tablespoons nonfat or reduced fat cream cheese
- 4 cups shredded fresh spinach
- 2 cups diced tomatoes
- 1 cup chopped cucumber
- ½ cup diced green chilies
- ½ cup sliced black olives
- ½ cup chopped red onion
- 1 cup chopped bell pepper (red, green, orange and yellow or a mixture of all)

Spread each tortilla with 1½ tablespoons of cream cheese. Top tortillas with equal amounts of vegetables. Roll up tightly to enclose filling. Slice each roll up into four pieces.

Adapted from: *Discover the Secret to Healthy Living*, Public Health Institute, 2004.

For more ideas, reference:

Kids Cook Farm-Fresh Food, CDE, 2002.

Eat Your Colors

Fruits and vegetables come in a rainbow of colors. Eat a variety of colorful fruits and vegetables every day — red, yellow/orange, white, green and blue/purple. Spinach is in the green color group.

- Green fruits and vegetables help maintain vision health and strong bones and teeth. They may also lower the risk of some cancers. Examples include spinach, cabbage, celery, leeks, peas, collards, avocados, kiwis, honeydew melon and green grapes.

For more information, visit:

www.fruitsandveggiesmatter.gov
www.harvestofthemonth.com

March Events

- National Nutrition Month
- National School Breakfast Week
- National Agriculture Week

Reasons to Eat Spinach

Two cups of raw spinach leaves provide:

- More than 100 percent of the Daily Value (DV) for Vitamin A. It also provides more than four times the recommended DV for Vitamin K.
- An excellent source of folate (30% DV), Vitamin C (28% DV) and the mineral manganese (26% DV). In fact, spinach is the richest plant source containing folate.
- A good source of many essential minerals including magnesium, potassium and iron.
- A source of fiber, calcium, thiamin and Vitamin B6.

Serving sizes for spinach vary for raw and cooked leaves. Sizes also vary for children and adults. For children, a serving is one cup of raw leaves and a half-cup cooked. For adults, a serving is two cups of raw leaves and one cup cooked.

What's in a Name?

Pronunciation: spīn'itch

Spanish name: espinaca

Family: Amaranthaceae

Genus: *Spinacia*

Species: *S. oleracea*

Spinach is an annual plant of the family Amaranthaceae, which includes widely distributed shrubs and herbs. Spinach consists of small and medium leaves that are bright green, thick, soft, oval to arrow-shaped with green stems. Both the leaves and stems are edible. The leaves form rose-like clusters or rosettes from which flowering shoots emerge.

The name "spinach" has been applied to a number of leaf vegetables that are unrelated or only distantly related to spinach including: New Zealand spinach (Aizoaceae family), Water spinach (Convolvulaceae family), Malabar spinach (Basellaceae family), and Orach (Chenopodiaceae family) which is also referred to as "French spinach" or "mountain spinach." In reality, there are three main varieties of spinach:

- The **savoy** variety has crinkly, dark green, curly leaves. The texture is rough and it has a very distinct taste. This variety is most commonly sold as fresh bunches.
- The **flat or smooth leaf**, which is unwrinkled and spade-shaped, has a milder taste than the savoy. This variety is commonly used for canned and frozen spinach, as well as for soups, baby foods and other processed foods.
- **Semi-savoy**, which has slightly curly leaves, is increasing in popularity as its leaves are easier to clean than the savoy. This variety is usually sold fresh, but it can also be found in processed foods.

For more information, visit:

www.uga.edu/vegetable/



How Does Spinach Grow?

Spinach is grown mainly in California and Texas as a cool winter crop. An annual plant, spinach grows best in cool, damp weather and rich, moist soil. Spinach is typically planted by direct seeding, about one-half to three-quarter inches deep in soil, in four to eight rows on raised beds that are 38 to 40 inches wide. Generally, around 10 to 15 pounds of seeds are planted per acre (there are about 40,000 seeds in one pound).

California producers may sow as many as 1.3 million seeds per acre in a six- or eight-row configuration for spinach that will be sold fresh in bunches (fresh market). Fresh market spinach is planted at a rate up to twice as fast as the rate of spinach that will be used for processed foods (processed spinach) because the crop is harvested at a younger stage, when leaves are small and vertical.

In California, a fresh market crop of spinach requires approximately nine to 12 inches of water. The first irrigation is usually applied immediately after planting to encourage germination (causing the seeds to begin sprouting and growing) and the soil is kept moist throughout the growing season. Growers are careful to avoid saturating fields in order to prevent rotting in the lower leaves and crowns.

In the last third of the growing period, spinach increases in size by about 66 percent. Spinach crops are harvested in the late afternoon when plant turgidity (swollen from water) is low. Dry and slightly wilted foliage prevents breakage in the petiole, which is the stalk that attaches the leaf to the stem. Plants with five to eight mature leaves, three to six inches long are ready for harvest. Fresh market spinach is hand harvested, a method that involves either cutting the plants below the stems or pulling them out of the ground. Processed spinach and some fresh market spinach are mechanically harvested. Stems are cut about four to six inches above the growing point to reduce damage to the petiole tissue, allowing for re-growth. The second harvest takes place about three to four weeks later.

For more information, visit:

www.leafy-greens.org/greens/spinach_nn.html

www.uga.edu/vegetable/spinach.html

Student Sleuths

- 1 Research the nutritional benefits of folate. What are some other food sources that contain folate?
- 2 How does spinach compare in protein-content versus other green vegetables, such as broccoli, leaf lettuce, green beans and avocados?
- 3 Spinach contains oxalic acid, which binds with iron and calcium and reduces the absorption of these minerals. Ask students to provide ways to help improve absorption of these minerals while eating spinach.
- 4 Ask students to research chlorophyll and its role in the growth process of plants and vegetables.

For information, visit:

www.leafy-greens.org/greens/spinach_nn.html

www.ipmcenters.org/cropprofiles/docs/caspinach.html

www.fruitsandveggiesmatter.gov/month/spinach.html

School Garden: Growing Classroom Herbs

Many plants can be easily started in a classroom where there is ample light (a window sill) and by using seeds, cuttings or plants. If the weather outside permits, spinach and herb plants can also be easily planted in a school garden. Spinach must have at least six weeks of cool weather from seeding to harvest.

Supplies:

- Shallow flower containers
- Seeds (herbs, spinach, etc.)
- Potting mix ($\frac{1}{3}$ sand, $\frac{1}{3}$ peat moss, $\frac{1}{3}$ soil)

Activity:

- Fill flowerpots with potting mix
- Plant small herb seeds no more than $\frac{1}{4}$ -inch deep; or, sprinkle on top of soil and cover lightly with potting mix
- Mist soil and cover containers with plastic to keep seeds moist until germination
- Give herb plants room to grow to maturity (one seedling per four-inch container or two plants per six-inch container)
- When ground outside is ready, transfer plants to garden

Adapted from:

www.garden.org/articles/articles.php?q=show&id=2116

For more ideas, visit:

www.cde.ca.gov/re/pn/

www.foodlandpeople.org/resources.pdf

Veggie Facts

According to USDA's Economic Research Service, annual consumption of all kinds of spinach (fresh, frozen and canned) jumped 66 percent from 1992 to 2002. This is mostly due to the availability of pre-cut, bagged spinach.

Chlorophyll, or a group of green pigments found in plants and vegetables, like spinach, can be used to create a phenomenon called "fluorescence," which is essentially the same phenomenon as a neon light.

Spinach was the first frozen vegetable to be sold for commercial use.

There are 40,000 seeds in one pound. It takes about 600,000 seeds to grow one acre of spinach plants.

Cafeteria Connections

- Capitalize on the well-known cartoon figure Popeye to promote spinach. Use cartoons, school announcements and the school cafeteria menu to promote Popeye's favorite vegetable — spinach.
- Work with a few classrooms (possibly any art classes) and have students create "cartoons" that promote the benefits of spinach. Students can develop either posters or cartoon strips that include nutrition information, history and other interesting facts.
- Older students can develop and implement a media campaign to promote spinach and other leafy green vegetables.

For more ideas, reference:

Fruits and Vegetables Galore, USDA, 2004.

Home Grown Facts

- California is the leading producer of fresh market and processed spinach in the United States.
- Processed spinach accounts for about 74 percent of all spinach grown in California. It is used for canning and freezing, as well as for baby food (puréed).
- Spinach is produced in four major areas in California: the north central coast (includes Monterey, San Benito, Santa Clara and Santa Cruz counties), the central San Joaquin Valley (Stanislaus and Tulare counties), the southern and desert valleys (Imperial and Riverside counties), and the south central coast (Santa Barbara and Ventura counties).
- Almost half of California's spinach acreage and production is located in Monterey County.
- Most of the spinach produced in the San Joaquin Valley is used for processing due to lower production costs in this region.

For more information, visit:

www.ipmcenters.org/cropprofiles/docs/caspinach.html

www.cdffa.ca.gov

A Leaf of Spinach History

Spinach originally came from Persia (now Iran) where it was known as *aspanakh*. The green, leafy vegetable made its way to China in the 7th century, when the king of Nepal sent it as a gift. Spinach was eventually brought to Europe in the 11th century, when it was introduced to Spain by the Moors (Muslims). In fact, spinach was known as "the Spanish vegetable" in England.

In the 16th century, spinach became the favorite vegetable of Catherine de Medici of the famous Medici family of the Italian Renaissance. When she left her home in Florence, Italy, to marry King Henry II of France, she brought along her own cooks who could prepare spinach in the many different ways that she liked. Since this time, dishes prepared on a bed of spinach are referred to as *à la Florentine*.

Spinach began being cultivated in North America by the early 19th century. In recent times, it has been popularized by the cartoon character, Popeye, who attributes his amazing strength to a daily diet of the green, leafy vegetable. In fact, when Popeye made his debut on January 17, 1929, spinach became the third most popular children's food after turkey and ice cream. Today, more than 94 percent of Americans associate spinach with Popeye.

Student Sleuths

- 1 Determine how much of the spinach harvested in California goes into processed and frozen foods versus how much is available to be sold whole/fresh.
- 2 On a blank California map, ask students to create a color key and color in which counties grow the highest volume of spinach, second highest, etc.

For information, visit:

www.ipmcenters.org/cropprofiles/docs/caspinach.html

Physical Activity Corner

It is important that children have fun while maintaining an active lifestyle. One of the best ways to ensure that students have fun while engaged in an activity is to allow them to take part in the decision-making process. For the month of March, allow students the opportunity to plan their own daily physical activity. This will also help reinforce their understanding of why they need to get at least one hour of physical activity every day.

Toss Up Some Physical Activity

Supplies:

- Vegetable paper cut-outs
- Fruit paper cut-outs
- Mixing bowl

Activity:

- Start with discussion about differences between aerobic and anaerobic exercises
- Students write down aerobic exercises they can do on vegetable cut-outs
- Students write down anaerobic exercises they can do on fruit cut-outs
- Toss the “salad” in mixing bowl
- Have a volunteer select a vegetable or fruit cut-out from the bowl
- Do the aerobic or anaerobic activity as a class

Go Farther: Ask students to count their pulse for 60 seconds after each activity and record it in a log. At the end of the month, compare the changes between aerobic and anaerobic activities.

Bring It Home: Encourage students to explain the differences between aerobic and anaerobic activities to family members. Students can also challenge family members to do these types of activities.

For more ideas, visit:
www.verbnow.com

Students for Spinach

Encourage students to write to the manager of their local grocery store or favorite restaurant asking that their business feature spinach in the produce aisles or on the menu and daily specials. Provide the manager with spinach information along with ideas for displays, in-store taste testings and recipes. Additionally, students can offer the manager promotional posters, inserts and student-made handouts for the store (see *Cafeteria Connections* on page 3 for more ideas). Materials can provide customers with spinach nutrition facts, recipes and healthy information while also letting them know that the retail business is supporting a local school.

Literature Links

- **Primary:** *Tiny Green Thumbs* by Loretta Krupinski, *Sun Song* by Jean Marzollo and *What is a Plant?* by Bobbie Kalman.
- **Secondary:** *Green Power: Leaf and Flower Vegetables* by Lerner Publishing Group, *Sell What You Sow* by Eric Gibson, and *Seeds of Change* by Herman Viola and Carolyn Margolis.

Adventurous Activities

Problem Solving:

- Present students with a variety of nutrition fact labels from various fruits and vegetable products, including spinach.
- Compare serving sizes and calculate the differences in specific nutrients for each food.

Science Investigation:

- Distribute a variety of *Fruit and Vegetable Photo Cards* (CDE, 1997) to students. Ask them to think about why plants have so many different colors and what effect(s) environmental factors might contribute to their variations. What purpose might these factors serve for the plant? Have students use the information on the Photo Cards, as well as what they know and have observed, to help them answer these questions.

History Exploration:

- Besides food, spinach has been used throughout history in class systems, art, medicine and science — even war. Ask students to research how spinach was utilized throughout history and choose a specific use they find interesting. Have students prepare and present their findings. Ask them to include visuals, interesting facts and background.

For more ideas, visit:
www.aginclassroom.org
www.nal.usda.gov/kids



Next Month: Carrots

